Nonnuclear Safety Analysis Process at the Oak Ridge Y-12 Plant

David W. Sheffey

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Oak Ridge Y-12 Plant
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Nonnuclear Safety Analysis Process at Y-12

- **Consistent with ISMS core functions**
  - **Defines scope of work**
  - **Analyzes hazards**
  - **Develops and implements controls**
- **Based on PSM approach developed by CCPS and utilized by the most responsible companies in the commercial chemical industry**
- **Includes**
  - **Process for identifying threshold for applying the safety analysis process**
  - **Content and format of the attendant safety document**
  - **Management of change**

Scope

- **Applicable to facility-level activities involving "significant" chemical hazards based on maximum anticipated quantities (MAQs) of hazardous material. [MAQs become limits not to be exceeded without proper approvals.]**

- **Screening based on MAQs reported in Hazard Identification Documents and Emergency Management Hazard Assessment Process**

  - **Facilities having MAQs meeting or exceeding TQs identified in 29 CFR 1910.119 or 40 CFR 68 are classified as PSM/RMP facilities and must meet rule requirements**

  - **Facilities with release scenarios exceeding Emergency Management Protective Action Criteria (ERPG-2 or equivalent) at 100 m are classified as Chemically Hazardous**

Scope (Continued)

- **Exclusions**
  - **Releases due to acts of sabotage**
  - **Other scenarios unsuitable for safety analysis**
  - **Facilities already having authorization basis documents**
- **Additions based on management prerogative**

Hazard Analysis

- **Utilizes Hazard Evaluation Studies based on process described in *Guidelines for Hazard Evaluation Procedures*, published by CCPS**
  - **Hazard Identification Documents**
  - **Other process safety information, lessons learned, etc.**
  - **Formal analysis methodologies (What-If, What-If/Checklist, HAZOP, etc.)**
  - **Multi-disciplined team approach**
  - **Identifies recommendations and issues early in project life cycle for new or modified facilities**

Development and Implementation of Controls

- **Engineered and administrative controls identified through the hazard evaluation process**
- **Process is primarily qualitative; however, quantitative analyses are used when necessary**
- **Safety SSCs with preventative or mitigative functions providing a major contribution to public safety, defense-in-depth, or worker safety are designated Safety Significant for Nonnuclear Safety**

Documentation

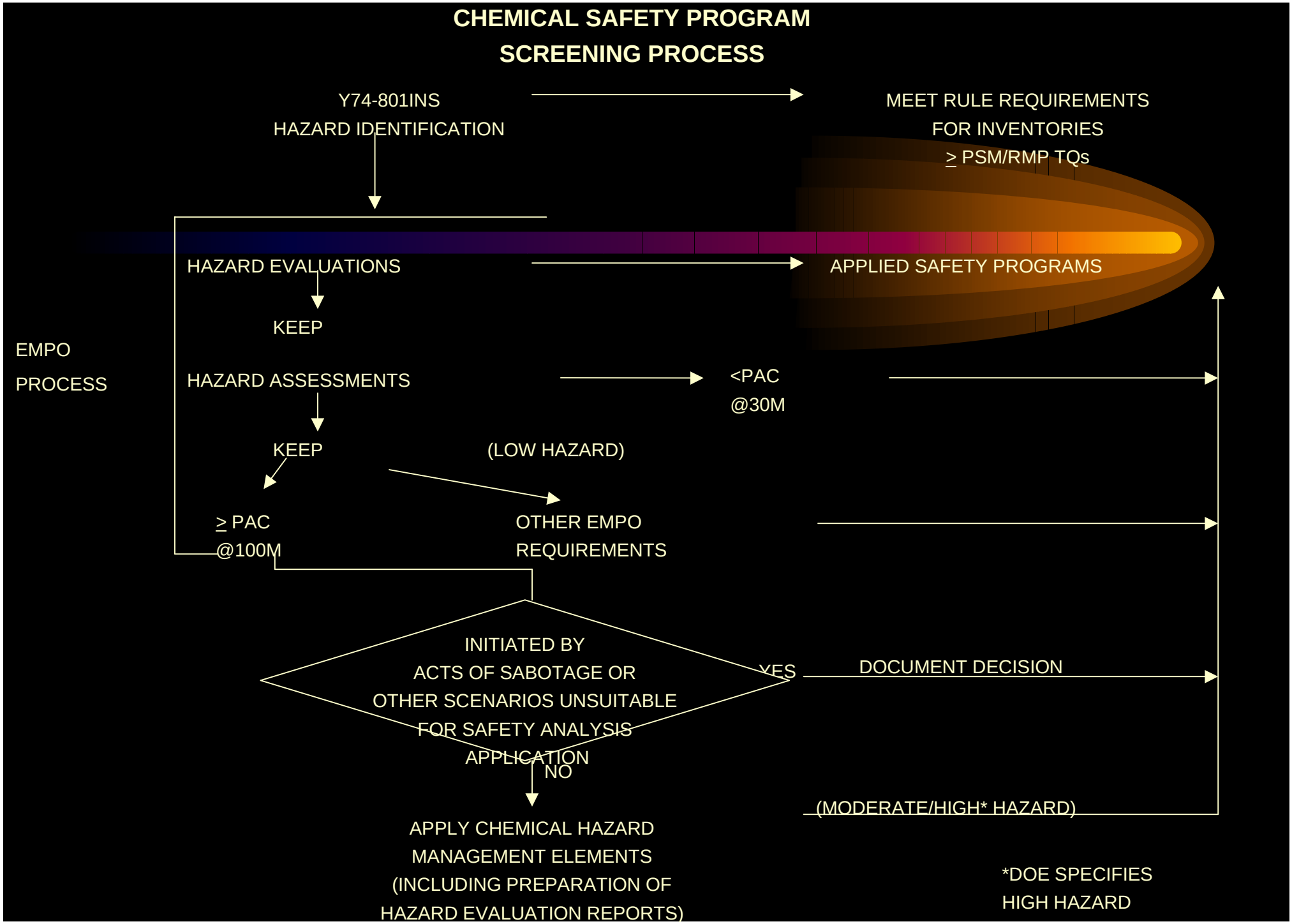
- **Authorization basis documents approved by DOE**
  - **SARs (per STD 3009, as applicable) for PSM/RMP facilities and others as designated**
  - **Hazard Evaluation Reports (HERs) for Chemically Hazardous facilities, except those designated to have a SAR**
  - **TSR-like controls and limitations are contained in the SAR or HER**

Change Control

- **USQD process reserved for facilities having SARs**
- **Change evaluation process [modeled after 29 CFR 1910.119(l)] applied to:**
  - **Ensure major changes invalidating the HER are identified and addressed prior to implementation**
  - **Provide adequate compensatory measures until discovery conditions are resolved**
- **Based primarily on engineering judgement by individuals held accountable**

Content and Format for HERs

- REVISION LOG
- EXECUTIVE SUMMARY
- 1. INTRODUCTION
  - 1.1 Objectives
  - 2.1 Analysis Scope
- 2. FACILITY DESCRIPTION
- 3. PROCESS HAZARD EVALUATION
  - 3.1 Analysis Techniques
    - 3.1.x - Include a section for each analysis methodology applied (e.g., HAZOP, Checklist, What-If, etc.). Discuss the technique, those portions of the facility process to which it is applied, and reference the appendix containing the results
  - 3.2 Results
    - 3.2.1 Hazards of the Process, including identification of MAQs of hazardous materials
    - 3.2.2 Incidents
    - 3.2.3 Engineered and Administrative Controls (including limitations)
    - 3.2.4 Consequences of Failure of Controls
    - 3.2.5 Siting
    - 3.2.6 Human Factors
    - 3.2.7 Possible Safety and Health Effects
- Appendix X Results, including appendices documenting the results of each review
- Appendix X+ Summary of Incident Reports
- Appendix X++ Other appendices as necessary
- List of Tables As appropriate, including
  - 3.2.3-x Safety Significant SSCs for nonnuclear safety and associated natural phenomena PCs
  - 3.2.3-y Inspection, Testing, and Preventative MaintenanceRequirements for Safety Significant SSCs
- List of Figures As appropriate


CHEMICAL SAFETY PROGRAM
SCREENING PROCESS
Y74-801INS
HAZARD IDENTIFICATION
MEET RULE REQUIREMENTS
FOR INVENTORIES
≥ PSM/RMP TQs
HAZARD EVALUATIONS
APPLIED SAFETY PROGRAMS
KEEP
EMPO
PROCESS
HAZARD ASSESSMENTS
<PAC
@30M
KEEP
(LOW HAZARD)
≥ PAC
@100M
OTHER EMPO
REQUIREMENTS
INITIATED BY
ACTS OF SABOTAGE OR
OTHER SCENARIOS UNSUITABLE
FOR SAFETY ANALYSIS
APPLICATION
YES
DOCUMENT DECISION
NO
(MODERATE/HIGH* HAZARD)
APPLY CHEMICAL HAZARD
MANAGEMENT ELEMENTS
(INCLUDING PREPARATION OF
HAZARD EVALUATION REPORTS)
*DOE SPECIFIES
HIGH HAZARD